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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Angular-drive Units

I, CHARLES BARRINGTON LEEK, a British Subject, of 79, Spring Gardens, Leek, in the County of Stafford, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to angular-drive units of the kind in which bevel gears mounted in bearings in a common case are employed to transmit rotary motion smoothly and positively from one place to another.

Existing units of this kind are restricted as regards their method of integrating the gear-case with associated machinery, so that the designers and builders of the latter are obliged to conform to the drive unit's own design, the gear-case itself being a special casting or fabrication requiring machining and boring which makes it a costly article to produce.

According to the present invention, which has for its object an improved angular-drive unit not subject to the above-mentioned drawbacks, the gear-case of such unit is a standard pipe fitting with internally-threaded limbs into which the necessary bearing housings can be screwed.

Such pipe fittings are always readily available, manufactured to rigid specifications which ensure the accuracy necessary for their satisfactory use in accordance with the invention, and inexpensive as compared with the machined gear-case hitherto employed.

Furthermore, drive units constructed as above described are conveniently attachable to adjacent machinery by means of other, standard pipe fittings readily available for use in conjunction with the fittings utilized as gear-cases.

The drawing filed with the Provisional Specification is a sectional side elevation of one form of angular drive unit according to the present invention.

It will be seen that a pair of mitre bevel gears A, A_1 are respectively mounted in ball-bearings B, B_1, their bosses being a light drive-fit up to their shoulders in the inner races of such bearings and retained thus by means of collars C, C_1. These collars are located upon the gear bosses by means of grub screws E, E_1 and received to clear circlips D, D_1 which cooperate with other circlips D_2, D_3 in locating the ball-bearings B, B_1 in housings F, F_1.

Such housings are designed to screw into the internally-threaded limbs of a standard pipe elbow G until correct engagement of the bevel gears A, A_1 has been achieved, their outer ends having peripheral slots (not shown) to facilitate their insertion and adjustment by means of a suitable tool and their final location being effected by screw dowels H, H_1.

Lubricant for the bevel gears A, A_1 and ball-bearings B, B_1 is introduced into the elbow G by way of an oil-cup I or equivalent means screwed into whichever happens to be the uppermost of three tapped holes provided in such elbow at various positions, the remaining holes receiving screw-plugs of which one serves for drainage purposes.

The ball-bearings B, B_1 may be of the single-seal type and fitted with the seal at the outer end in each case, or alternatively they may be of the double-seal type and 'sealed for life' with their own lubricant.

The hollow bosses of the bevel gears are adapted for keyed engagement with standard shafts, and if the housings F, F_1 are assembled in position with jointing compound, the insertion of such shafts, or alternatively the use of gears with blind bores and keyways, will suffice to contain all lubricant within the elbow G.

Provided that the shafts are supported by bearings reasonably near to the drive unit no further support is required for the latter, but it may be preferred to pass the shafts through standard pipes and/or pipe fittings which are

[*Price* 4*s.* 6*d.*]

screwed into the elbow threads J, J_1 at the outer sides of the bearing housings F, F_1 and which may carry back-nuts adapted to be locked against the ends of the elbow G, such pipes and/or pipe fittings being utilized as mounting means for the drive unit as well as protecting the associated shafts.

Alternatively the bosses of the bevel gears may be extended to form stub shafts projecting from the adjacent limbs of the elbow.

It will be understood that the pipe fitting which forms the casing of the drive unit need not necessarily be of elbow form. For example, a Tee fitting may be used in the manner described to accommodate either two or three bevel gears and their bearings, one gear being mounted in the shank portion of the fitting to mesh with another gear on a shaft passing into or through the head portion, or with gears on contra-rotating shafts in opposite ends of the latter.

Similarly, one limb of a cross fitting may accommodate a gear in mesh with a gear in one or each of the two limbs which extend perpendicular to the first, or four gears in mesh one with the next may be mounted in the four limbs of the fitting, any limb not traversed by a shaft being blanked off by a screw-plug or engaged by a supporting pipe or pipe fitting.

Furthermore, when one limb of the pipe fitting utilized as gear-casing is of larger diameter than the other or others, it may accommodate a correspondingly larger gear wheel, so that the gears in adjacent limbs of the fitting will rotate at different speeds.

It is not, of course, essential that any given gear be supported by a single bearing, and two ball-races may be mounted side-by-side whenever the dimensions of the pipe fitting permit.

WHAT I CLAIM IS:—

1. An angular-drive unit of the kind referred to, characterised in that the gear-case thereof is a standard pipe fitting with internally-threaded limbs into which the necessary bearing housings can be screwed.

2. An angular-drive unit according to Claim 1, further characterised in that the bearing housings are located by means of screw dowels after appropriate axial adjustment of the associated bevel gears.

3. An angular-drive unit according to Claim 1 or Claim 2, further characterised in that the bearings comprise ball-bearings located in the housings by means of circlips.

4. An angular-drive unit according to Claim 3, further characterised in that the inner races of the ball-bearings are fitted tightly around the bosses of the associated bevel gears, being retained in engagement therewith by collars passed over said bosses and located by grub-screws.

5. An angular-drive unit according to any one of the preceding claims, further characterised in that tapped holes are formed in the pipe fitting at various positions, one such hole receiving lubrication means and the others being closed by screw-plugs.

6. An angular-drive unit according to any one of the preceding claims, further characterised in that each bearing is provided with an oil-seal at its outer side or at both sides thereof.

7. An angular-drive unit according to any one of the preceding claims, further characterised in that the bosses on the bevel gears are extended to form stub shafts projecting from the limbs of the pipe fitting.

8. An angular-drive unit according to any one of the preceding Claims and supported wholly by means of shafts carrying the bevel gears.

9. An angular-drive unit according to any one of Claims 1 to 7, further characterised in that shafts carrying the bevel gears are enclosed by standard pipes and/or pipe fittings screwed into the limbs of the fitting which is used as a gear-case and serving as mounting means for the latter.

10. An angular-drive unit according to any one of the preceding claims, further characterised in that any limb of the gear-case fitting not traversed by a shaft is blanked off or engaged by a supporting pipe or pipe fitting.

11. An angular-drive unit according to any one of the preceding Claims, further characterised in that any two limbs of the pipe fitting used as gear-case are of different diameters so that different-sized gears can be accommodated therein.

12. An angular-drive unit substantially as herein described with reference to, and as shown in, the drawing filed with the Provisional Specification.

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1 SHEET *This drawing is a reproduction of the Original on a reduced scale*